



Minix

Reduce aircraft vortex and pollution



Minix, is french innovative cleantech which allow aircraft to reduce their vortex impact and pollution. It is not limited to aircraft since it can be adapted for rotor blades, wind turbine blades and various other applications

PRESENTATION

French inventor Christian Hugues has patented a new wingtip device named Minix. The [Minix](#) system consists of a hollow cylindrical tube that dissipates wake vortex by passing it through a series of helical slits before it linearly flows out of an opening in the rear of the wingtip. Having tested some 22 prototypes in a wind tunnel, the aeronautical engineering professor has been invited by Airbus to produce a pair of Minix units for testing on a 1/15th-scale model of the new A380. Hugues said that the system could be adapted for virtually any type of aircraft, including helicopters.

INNOVATION

[MINIX](#) takes the form of a cylindrical spiral cavity incorporating a helicoidal slot making it possible to reduce induced drag and marginal swirl (vortex) and increase wing or blade lift/drag ratio. Integrated with, or coupled to a wingtip, it can be adapted for all airfoils where lift or direction is used in triple axis (vertical, horizontal, and yaw) displacement.



The advantages of MINIX for the aerospace industry are:

-A 6% fuel saving or an increasing of the autonomy by 6% resulting in a net decrease of CO2 on each trip (1kg = 3.1 kg of kerosene CO2).

-Used in retrofit, quick and light, fits all the profiles and less expensive than a winglet, causes less mechanical stress on the 3 axes

-Increase in lift wingtips, reducing induced drag and vortex,

Shorter-Separation between aircraft and greater security for the approach and takeoff.

The advantages of MINIX for the wind turbines are:

- Bring to each wind turbine electric, an additional production of 14% average annually, reducing induced drag and vortex less noise,
- Fit into the blades of wind turbine retrofit vertical and horizontal onshore and offshore and also on the blades of sub-wind turbines,
- Causes less wear and less vibration on the pylon.

MARKET

[Minix](#) target markets are mainly Aircraft industry and wind turbine blades. MINIX can be adapted to fit the tips of wind turbine blades, either from the conceptual stage of design adding value to new blade technology, or in retrofit improving the efficiency of existing installations. Other additional benefits include reduced risk of damage and longer in-life service, extending significantly the five- year manufacturer's guarantee towards a potential 30- year operational life cycle. The application of MINIX to the Wind energy sector presents many opportunities, not least to countries tasked with achieving a fixed percentage of wind power by 2020.

STRATEGY

Christian Hugues has tested his invention in a windtunnel and predicts an 8% induced drag reduction. More testing is needed to tailor the design to larger wings and for higher Reynolds number conditions. French and US manufacturers have expressed interest in using the device.

<http://www.frenchcleantech.com/company/categories/energy-efficiency/profile/minix-reduces-aircraft-vortex-and-pollution.html>